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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/542,928	07/21/2005	Hans Peter Rath	275186US0PCT	9532
22850	7590	02/14/2006	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			TESKIN, FRED M	
			ART UNIT	PAPER NUMBER
			1713	

DATE MAILED: 02/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/542,928

Applicant(s)

RATH ET AL.

Examiner

Fred M. Teskin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 10 is/are rejected.
- 7) ☒ Claim(s) 6-9 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 072105.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

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The preliminary amendment of July 21, 2005, has been entered in full. Claims 1-10 are currently pending and under examination.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

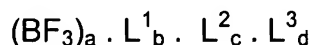
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined disclosures of US 5286823 to Rath and Research Disclosure No. 424060.

The rejected claims are drawn to a process for preparing polyisobutene having a content of terminal vinylidene groups of at least 75 mol % comprising polymerizing

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isobutene or isobutenic hydrocarbon mixtures in the liquid phase in the presence of a boron trifluoride complex catalyst of the composition:



where

- L^1 is water, a primary C_1 - C_5 -alkanol and/or a secondary C_3 - C_5 -alkanol,
- L^2 is at least one aldehyde and/or one ketone,
- L^3 is an ether having at least 5 carbon atoms, a secondary alkanol having at least 6 carbon atoms, a primary alkanol having at least 6 carbon atoms and/or a tertiary alkanol,
- the b:a ratio is in the range from 0.9 to 3.0,
- the c:a ratio is in the range from 0.01 to 0.5,
- the d:a ratio is in the range from 0 to 1.0.

Rath discloses a process for preparing highly reactive polyisobutenes having a content of terminal vinylidene groups of more than 80 mol %, which differs from the claimed process essentially in that polymerization is performed in the presence of a catalyst composition of mixed boron trifluoride complexes which lacks at least one aldehyde and/or one ketone in a ratio from 0.01 to 0.5, relative to BF_3 . See, col. 1, ll. 5-10 and Example 7, detailing the preparation of polyisobutene having 95 mol % of terminal double bonds by metering in as catalyst a boron trifluoride/2-butanol complex (equivalent ratio: 0.7), 10 mmol of boron trifluoride and 4 mmol of 2-butyl tert-butyl ether. An 0.7 equivalent ratio equates to a "b: a ratio" (2-butanol to BF_3) of 1.43, while

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the stated millimole quantities correspond to a "d: a ratio" of 0.4 (ether/ BF_3). Thus, Rath teaches the $(\text{BF}_3) \cdot \text{L}^1$ and $(\text{BF}_3) \cdot \text{L}^3$ complexes of the applicants' composition.

As indicated above, Rath lacks a teaching of an aldehyde or ketone as a complexing agent for BF_3 .

Nevertheless, it is known in the prior art to prepare polyisobutene having a high content of terminal vinylidene groups by use of BF_3 complexed with an aldehyde or ketone as polymerization catalyst, as evidenced by the Research Disclosure.

More specifically, the Research Disclosure reports a process for preparing polyisobutene having a content of terminal vinylidene groups of at least 70 mol % by contacting an isobutene-containing feedstock with a boron trifluoride catalyst and a cocatalyst which is an aldehyde or ketone, wherein the molar ratio of boron trifluoride to cocatalyst is in the range 2 to 0.25, which equates to cocatalyst/ BF_3 ratios in the range of 0.5 to 4 (see, pp. 1/1 –3/3). Since the 0.5 ratio coincides with the upper endpoint of the "c: a" range in claim 1, the Research Disclosure is considered to teach the $(\text{BF}_3) \cdot \text{L}^2$ complex of the applicants' composition.

Because the BF_3 complexes making up the composition used in the present invention are each taught by the prior art to be useful for the same purpose - i.e., to prepare polyisobutene having a high content of terminal vinylidene groups – it would have been obvious one of ordinary skill in the art to modify the Rath process by using its mixed BF_3 complex catalyst together with a BF_3 /cocatalyst as per the Research Disclosure. The motivation to so combine the compositions flows logically from their having been individually taught in the prior art. See, *In re Kerkhoven*, 205 USPQ 1069

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(CCPA 1980) (*prima facie* obvious to combine two compositions, each of which is taught by the prior art to be useful for the same purpose, to form third composition which is to be used for the very same purpose).

The limitations of claims 2-5 and 10 are either generically taught or fairly suggested by the applied art. Thus, species of L¹ and L² within claims 2 and 3 are contemplated by Rath (e.g., col. 5, ll. 65+) and the Research Disclosure (p. 2/3), respectively. Rath further teaches specific ethers within claim 5 as exemplary of dialkyl ethers useful in forming mixed boron trifluoride/sec. alcohol/dialkyl ether complex catalysts (col. 8, ll. 29+); and both references teach molecular weights (Mn) within the range of claim 10 (Rath, col. 4, ll. 1-5 and Research Disclosure, p. 2/3, eighth full paragraph).

Claims 6-9 are objected to as being dependent on a rejected base claim but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim.

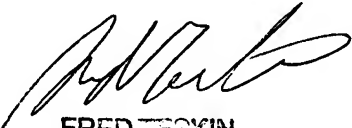
Any inquiry concerning this communication should be directed to Examiner F. M. Teskin whose telephone number is (571) 272-1116. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FMTeskin/02-07-06



FRED TESKIN
PRIMARY EXAMINER
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